# Software Testing and Validation – 2017/18

**Instituto Superior Técnico**

# *Vos* – Project Report

**Group 01 – Alameda**

**Francisca Cambra** ist181057

**Rui Ventura** ist181045

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## 1 Method-Scope Tests

### 1.1 `assignPhoneNumber`

Assigns a free phone number to a client of *Vos* if all conditions are met. If at least one of these conditions does not hold, then this method does not change anything and throws the `InvalidOperationException` exception.

- **Test Pattern**
  - Category-partition
- **Functions**
  - Primary function
    - Assign free phone number to a client without a number
  - Secondary functions
    - Throw `InvalidOperationException` if conditions aren't met
      - Invalid nif (nif $\notin [10^8, 10^9 - 1]$)
      - Invalid phone number (number $\notin [10^8, 10^9 - 1]$)
      - Client doesn't exist (valid nif)
      - Assign a previously assigned number to a client
- **I/O Parameters**
  - Input
    - `clientNif` – The nif of the client to assign a number to
    - `phoneNumber` – The phone number to be assigned
    - `clients` – The set of *Vos* clients managed by `ClientManager`
  - Output
    - `client` – The updated client, if a number was assigned successfully

- **Categories & Choices**

| Parameter | Category | Choices |
|---|---|---|
| `clientNif` | *Vos* client | $\#numbers \in [1, 5[$ |
| | | $\#numbers = 5$ (MAX) |
| | Special cases | $\texttt{client}_{\texttt{nif}}$[1] $\notin$ `clients` |
| | | `clientNif` $\notin [10^8, 10^9 - 1[$ |
| `phoneNumber` | *Vos* phone number | Free (Unassigned) |
| | | Not free (Assigned) |
| | Invalid number | `phoneNumber` $\notin [10^8, 10^9 - 1]$ |
| `clients` | $n$-elements | $n = 0$ (Empty) |
| | | $n \in [1, \text{MAX}]$ (Not empty) |

- **Constraints**
  - Empty `clients` list precludes the possibility of assigning a `phoneNumber`

- **Test Cases**

| | Choices | | | Expected Result | |
|---|---|---|---|---|---|
| # | `clientNif` | `phoneNumber` | `clients` | **Exception** | `client` |
| 1 | $\#numbers \in [1, 5[$ | Free | $n \in [1, \text{MAX}]$ | NO | $\#numbers \in ]1, 5]$ |
| 2 | $\#numbers \in [1, 5[$ | Not free | $n \in [1, \text{MAX}]$ | YES | — |
| 3 | $\#numbers \in [1, 5[$ | $\notin [10^8, 10^9 - 1]$ | $n \in [1, \text{MAX}]$ | YES | — |
| 4 | $\#numbers = 5$ | Free | $n \in [1, \text{MAX}]$ | YES | — |
| 5 | $\#numbers = 5$ | Not free | $n \in [1, \text{MAX}]$ | YES | — |
| 6 | $\#numbers = 5$ | $\notin [10^8, 10^9 - 1]$ | $n \in [1, \text{MAX}]$ | YES | — |
| 7 | $\texttt{client}_{\texttt{nif}} \notin$ `clients` | Free | $n \in [1, \text{MAX}]$ | YES | — |
| 8 | $\texttt{client}_{\texttt{nif}} \notin$ `clients` | Not free | $n \in [1, \text{MAX}]$ | YES | — |
| 9 | $\texttt{client}_{\texttt{nif}} \notin$ `clients` | $\notin [10^8, 10^9 - 1]$ | $n \in [1, \text{MAX}]$ | YES | — |
| 10 | $\notin [10^8, 10^9 - 1]$ | Free | $n \in [1, \text{MAX}]$ | YES | — |
| 11 | $\notin [10^8, 10^9 - 1]$ | Not free | $n \in [1, \text{MAX}]$ | YES | — |
| 12 | $\notin [10^8, 10^9 - 1]$ | $\notin [10^8, 10^9 - 1]$ | $n \in [1, \text{MAX}]$ | YES | — |

### 1.2 `computeBill` method

The responsibility of `computeBill` method is to determine the value to pay for a client taking into account all communications made by the client through all of his registered mobile phones

## 2 Class-Scope Tests

### 2.1 `Client` class

### 2.2 `Mobile` class

[1] A client whose nif is `clientNif`, not `clientNif` itself.